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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,406	11/19/2003	Charles Q. Zhan	120 06741US	7240

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EXAMINER	
LE, TOAN M	

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 07/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/717,406	ZHAN ET AL.	
	Examiner	Art Unit	
	Toan M. Le	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/21/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

With respect to claims 1, 8, 15, and 21, the method/apparatus/computer program/system does not produce a useful, concrete, and tangible result. It is unclear how the result is being stored, displayed, or used in any tangible manner. To view the new guidelines for 35 U.S.C. 101 please view the following OG notice.

http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-22 are rejected under 35 U.S.C. 102(a) as being anticipated by "Wavelet-Based Pressure Analysis for Hydraulic Pump Health Diagnosis", Gao et al. (referred hereafter Gao et al.).

Referring to claims 1, 8, and 15, Gao et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code (Abstract); comprising:

decomposing a signal comprising a plurality of process variable measurements into a plurality of decomposed signals at a plurality of resolution levels, the process variable measurements associated with operation of a valve (page 971, 2nd col., 3rd and last paragraphs to page 972, 1st col., 1st and 2nd paragraphs);

grouping the decomposed signals into a plurality of groups (page 971, 2nd col., 3rd and last paragraphs to page 972, 1st col., 1st paragraph); and

identifying one or more defect indicators for at least some of the resolution levels using the groups, the one or more defect indicators associated with a possible defect in the valve;

wherein identifying the one or more defect indicators for at least some of the resolution levels comprises, for each of the groups, using relationship between the decomposed signal in that group to identify one or more defect indicators at one of the resolution levels (page 971, 2nd col., 3rd and last paragraphs to page 972, 1st col., 1st and 2nd paragraphs; page 972, 2nd col., 2nd and 3rd paragraphs; page 976, 1st col., 1st paragraph).

As to claims 2, 9, and 16, Gao et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, wherein:

decomposing the signal comprises performing wavelet decomposition to generate wavelet coefficients at each of the resolution levels (page 971, 2nd col., 3rd and last paragraphs);

grouping the decomposed signals comprises grouping the wavelet coefficients at multiple resolution levels into groups of wavelet coefficients (page 972, 1st col., 1st paragraph; equation 10); and

identifying the one or more defect indicators comprises performing singularity detection using the groups of wavelet coefficients (page 972, 2nd col., 2nd and 3rd paragraphs; page 976, 1st col., 1st paragraph).

As to claims 3, 10, and 17, Gao et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code (page 971, 1st col., 1st, 2nd, and 3rd paragraphs; page 976, 1st col., 1st paragraph).

Referring to claims 4, 11, and 18, Gao et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, wherein the one or more defect indicators identify one or more jumps in the process variable measurements (page 971, 2nd col., 2nd paragraph).

As to claim 5, Gao et al. disclose a method, wherein the one or more jumps represent one or more deterministic signal changes where the process variable measurements change by a threshold amount within a given time period (page 969, 2nd col., 1st paragraph; page 971, 2nd col., 2nd paragraph).

Referring to claims 6, 12, and 19, Gao et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, further comprising:

selecting one of the resolution levels; and

determining a probability of a valve defect based on the defect indicators at the selected resolution level (page 971, 2nd col., 3rd and last paragraphs to page 972, 1st col., 1st and 2nd paragraphs).

Referring to claims 7 and 14, Gao et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, wherein grouping the decomposed signals levels into the plurality of groups comprises grouping the decomposed signals from three adjacent resolution levels into each groups, the groups forming overlapping groups where at least some of the decomposed signals form part of two or more groups (page 972, 2nd col., 2nd and 3rd paragraphs; figures 4-7).

As to claims 13 and 20, Gao et al. disclose an apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, wherein the one or more processors are further collectively operable to generate a second signal and supply the second signal to a valve adjuster, the valve adjuster operable to use the second signal to adjust an opening of the valve (figure 1; pages 970-971, Materials and Methods section; page 976, 1st col., 1st paragraph).

Referring to claims 21-22, Gao et al. disclose a system, comprising:

a valve (figure 1);

a measuring device operable to generate a signal comprising measurements of a process variable associated with operation of the valve;

a controller operable to generate output values for adjusting the valve based on the process variable measurements (pages 970-971, Materials and Methods section); and

a defect detector operable to:

decompose the signal into a plurality of decomposed signals at a plurality of resolution levels (page 971, 2nd col., 3rd and last paragraphs to page 972, 1st col., 1st and 2nd paragraphs);

group the decomposed signals into a plurality of groups, each group comprising decomposed signals at multiple resolution levels (page 971, 2nd col., 3rd and last paragraphs to page 972, 1st col., 1st paragraph); and

identify one or more defect indicators for at least some of the resolution levels using the groups, the one or more defect indicators associated with a possible defect in the valve, wherein the one or more defect indicators at one of the resolution levels are identified using relationships between the decomposed signals in one of the groups and wherein the defect detector forms part of the controller (page 971, 2nd col., 3rd and last paragraphs to page 972, 1st col., 1st and 2nd paragraphs; page 972, 2nd col., 2nd and 3rd paragraphs; page 976, 1st col., 1st paragraph; figure 1).

Response to Arguments

Applicant's arguments filed 4/28/06 have been fully considered but they are not persuasive.

Referring to claims 1, 8, 15, and 21, Applicant argues that "Gao recites a technique where a signal is decomposed into different 'sets' of sub-band signals. Gao lacks any mention of grouping 'decomposed signals' at multiple 'resolution levels' together and then using 'relationships' between those decomposed signals to identify 'defect indicators.' Instead. Gao uses a reassembled signal (which is produced using sets of sub-band signals) to determine if a pump is defective. Gao also compares individual high-frequency sub-band signals to identify the type of defect. Nothing in Gao anticipates grouping 'decomposed signals' at multiple 'resolution

levels' together and then using 'relationships' between those decomposed signals to identify 'defect indicators.'"

Gao discloses "When a signal satisfies the relationship of $P_{mo-1}\, f(t) = P_{mo-1}\, f(t) + D_{mo}\, f(t)$, it implies that the signal can be fine-scaled at $P_{mo}\, f(t) = f_o$ and be decomposed into $f_o = P_{mo-1}\, f(t) + D_{mo-1}\, f(t) = f_1 + d_1$, where f_1 is the next coarser approximation of f_o. The discrete model of wavelet analysis can therefore be represented as follows: (equation 9).

Using the same approach, f_i can be further decomposed into $f_i = f_{i+1} + d_{i+1}$, I=1, 2, ...,. Based on this scheme, a set of examining signals is decomposed using a low-pass filter and a high-pass filter, which results in two sets of sub-band signals. The sub-band signals are then reassembled to perform wavelet analysis." (page 971, 2nd col., 3rd paragraph to page 972, 1st col., 1st and 2nd paragraphs)

Thus, Gao does mention decomposing a signal into a plurality of decomposed signals at a plurality of resolution levels (equation 9), and grouping/reassembling the decomposed signals at multiple resolution levels together and then using relationships between those composed signals to identify defect indicators.

Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan M. Le whose telephone number is (571) 272-2276. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Toan Le

July 15, 2006

MICHAEL NGHIEM
PRIMARY EXAMINER